

Project Narrative File(s)

* Mandatory Project Narrative File Filename:

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EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name:	Prefix:	<input type="text"/>	First Name:	<input type="text" value="Bo"/>	Middle Name:	<input type="text"/>
	Last Name:	<input type="text" value="Wilkins"/>			Suffix:	<input type="text"/>
Title:	<input type="text" value="Bureau Chief, Air Quality Bureau Chief"/>					
Complete Address:						
Street1:	<input type="text" value="PO Box 200901"/>					
Street2:	<input type="text"/>					
City:	<input type="text" value="Helena"/>	State:	<input type="text" value="MT: Montana"/>			
Zip / Postal Code:	<input type="text" value="59601-4541"/>	Country:	<input type="text" value="USA: UNITED STATES"/>			
Phone Number:	<input type="text" value="406-444-0286"/>			Fax Number:	<input type="text"/>	
E-mail Address:	<input type="text" value="Bo.Wilkins@mt.gov"/>					

Payee: *Individual authorized to accept payments.*

Name:	Prefix:	<input type="text"/>	First Name:	<input type="text" value="Laci"/>	Middle Name:	<input type="text"/>
	Last Name:	<input type="text" value="Lake"/>			Suffix:	<input type="text"/>
Title:	<input type="text" value="Budget Analyst, AEMD"/>					
Complete Address:						
Street1:	<input type="text" value="PO Box 200901"/>					
Street2:	<input type="text"/>					
City:	<input type="text" value="Helena"/>	State:	<input type="text" value="MT: Montana"/>			
Zip / Postal Code:	<input type="text" value="59601-4541"/>	Country:	<input type="text" value="USA: UNITED STATES"/>			
Phone Number:	<input type="text" value="406-444-2929"/>			Fax Number:	<input type="text"/>	
E-mail Address:	<input type="text" value="Laci.Lake2@mt.gov"/>					

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name:	Prefix:	<input type="text"/>	First Name:	<input type="text" value="Denise"/>	Middle Name:	<input type="text" value="J."/>
	Last Name:	<input type="text" value="Kelly"/>			Suffix:	<input type="text"/>
Title:	<input type="text" value="Financial Operations Manager, AEMD"/>					
Complete Address:						
Street1:	<input type="text" value="PO Box 200901"/>					
Street2:	<input type="text"/>					
City:	<input type="text" value="Helena"/>	State:	<input type="text" value="MT: Montana"/>			
Zip / Postal Code:	<input type="text" value="59601-4541"/>	Country:	<input type="text" value="USA: UNITED STATES"/>			
Phone Number:	<input type="text" value="406-444-4964"/>			Fax Number:	<input type="text"/>	
E-mail Address:	<input type="text" value="DenKelly@mt.gov"/>					

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: **Prefix:** **First Name:** **Middle Name:**

Last Name: **Suffix:**

Title:

Complete Address:

Street1:

Street2:

City:

State:

Zip / Postal Code:

Country:

Phone Number:

Fax Number:

E-mail Address:

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name:

Address:

City:

State: Zip Code:

B. DUNS No.

II. Is the applicant currently receiving EPA Assistance? ☒ Yes ☐ No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

N/A

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

N/A

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

N/A

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☐ Yes ☒ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☐ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R. 5.140 and 7.95)

☒ Yes ☐ No

a. Do the methods of notice accommodate those with impaired vision or hearing?

☒ Yes ☐ No

b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications?

☒ Yes ☐ No

c. Does the notice identify a designated civil rights coordinator?

☒ Yes ☐ No

VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a))

☒ Yes ☐ No

IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)

☒ Yes ☐ No

- X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.**

Christina Lipetzky, Human Resource Manager, Montana Department of Environmental Quality, PO Box 200901, Helena, MT 59601-4541, phone (406)444-6717, CLipetzky@mt.gov

- XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.**

Christina Lipetzky, Human Resource Manager, Montana Department of Environmental Quality, PO Box 200901, Helena, MT 59601-4541, phone (406)444-6717, CLipetzky@mt.gov

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official

Denise Kelly

B. Title of Authorized Official

Deputy Director

C. Date

03/24/2022

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statutes and EPA regulations.

A. *Signature of Authorized EPA Official

B. Title of Authorized Official

C. Date

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.

Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

Other Attachment File(s)

* Mandatory Other Attachment Filename:

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To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment

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BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Air Quality Monitoring for Communities	66.034	\$	\$	452,871.00	\$	452,871.00
2.						
3.						
4.						
5. Totals		\$	\$	452,871.00	\$	452,871.00

Standard Form 424A (Rev. 7-97)
Prescribed by OMB (Circular A -102) Page 1

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	Air Quality Monitoring for Communities				
a. Personnel	\$ 0.00	\$	\$	\$	\$ 0.00
b. Fringe Benefits	0.00				0.00
c. Travel	0.00				0.00
d. Equipment	254,260.00				254,260.00
e. Supplies	98,360.00				98,360.00
f. Contractual	24,000.00				24,000.00
g. Construction	0.00				0.00
h. Other	68,612.00				68,612.00
i. Total Direct Charges (sum of 6a-6h)	445,232.00				\$ 445,232.00
j. Indirect Charges	7,639.00				\$ 7,639.00
k. TOTALS (sum of 6i and 6j)	\$ 452,871.00	\$	\$	\$	\$ 452,871.00
7. Program Income	\$ 0.00	\$	\$	\$	\$ 0.00

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Prescribed by OMB (Circular A -102) Page 1A

SECTION C - NON-FEDERAL RESOURCES					
(a) Grant Program		(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8.	Air Quality Monitoring for Communities	\$	\$	\$	\$
9.					
10.					
11.					
12. TOTAL (sum of lines 8-11)		\$	\$	\$	\$

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 452,871.00	\$ 113,218.00	\$ 113,218.00	\$ 113,218.00	\$ 113,217.00
14. Non-Federal	\$				
15. TOTAL (sum of lines 13 and 14)	\$ 452,871.00	\$ 113,218.00	\$ 113,218.00	\$ 113,218.00	\$ 113,217.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT					
(a) Grant Program		FUTURE FUNDING PERIODS (YEARS)			
		(b)First	(c) Second	(d) Third	(e) Fourth
16.	Air Quality Monitoring for Communities	\$	\$	\$	\$
17.					
18.					
19.					
20. TOTAL (sum of lines 16 - 19)		\$	\$	\$	\$

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges: \$445,232.00	22. Indirect Charges: \$7,639.00
23. Remarks: Indirect Rates: Operating Indirect Rate of 4.00%. Equipment Indirect 0.00% Operating (190,972 * .04 = 7,639) + Equipment (254,260 * .00 = 0) = \$7,639.00	

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Prescribed by OMB (Circular A -102) Page 2

Application for Federal Assistance SF-424

* 1. Type of Submission:

- ☐ Preapplication
☒ Application
☐ Changed/Corrected Application

* 2. Type of Application:

- ☒ New
☐ Continuation
☐ Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received:

03/24/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

Montana

8. APPLICANT INFORMATION:

* a. Legal Name:

Montana Department of Environmental Quality

* b. Employer/Taxpayer Identification Number (EIN/TIN):

81-0302402

* c. Organizational DUNS:

1124816480000

d. Address:

* Street1:

1520 E Sixth Ave

Street2:

* City:

Helena

County/Parish:

* State:

MT: Montana

Province:

* Country:

USA: UNITED STATES

* Zip / Postal Code:

59601-4541

e. Organizational Unit:

Department Name:

Environmental Quality

Division Name:

Air, Energy & Mining

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

* First Name:

Denise

Middle Name:

J.

* Last Name:

Kelly

Suffix:

Title: Financial Operations Manager

Organizational Affiliation:

Montana Department of Environmental Quality

* Telephone Number:

406-444-4964

Fax Number:

* Email:

DenKelly@mt.gov

Application for Federal Assistance SF-424

* 9. Type of Applicant 1: Select Applicant Type:

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

* 10. Name of Federal Agency:

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities
Relating to the Clean Air Act

* 12. Funding Opportunity Number:

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment

Delete Attachment

View Attachment

* 15. Descriptive Title of Applicant's Project:

This proposal presents DEQ's plan to improve our statewide PM2.5 monitoring network through
installation of additional monitoring stations and sensors in key locations.

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

Application for Federal Assistance SF-424**16. Congressional Districts Of:**

* a. Applicant

00

* b. Program/Project

01

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment

Delete Attachment

View Attachment

17. Proposed Project:

* a. Start Date:

11/01/2022

* b. End Date:

10/31/2025

18. Estimated Funding (\$):

* a. Federal

452,871.00

* b. Applicant

0.00

* c. State

0.00

* d. Local

0.00

* e. Other

0.00

* f. Program Income

0.00

* g. TOTAL

452,871.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**☐ a. This application was made available to the State under the Executive Order 12372 Process for review on☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.☒ c. Program is not covered by E.O. 12372.*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**☐ Yes☒ No

If "Yes", provide explanation and attach

Add Attachment

Delete Attachment

View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:

* First Name:

James

Middle Name:

* Last Name:

Fehr

Suffix:

* Title:

Deputy Director

* Telephone Number:

406-444-2544

Fax Number:

* Email:

james.fehr@mt.gov

* Signature of Authorized Representative:

Denise Kelly

* Date Signed:

03/24/2022



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
COGNIZANT AGENCY
NEGOTIATION AGREEMENT

Page 1 of 2

State of Montana
Department of Environmental Quality
Helena, Montana

Date: February 18, 2022

Filing Ref: March 1, 2021

The indirect cost rates contained herein are for use on grants and contracts with the Federal Government to which Office of Management and Budget Circular 2 CFR Part 200 applies, subject to the limitations contained in the Circular and in Section II, A below.

SECTION I: RATES

Type	Effective Period		Rate	Base	Location	Applicable To
	Start	End				
<u>Fixed with carryforward:</u>						
Indirect Rate	7/1/2022	6/30/2023	24.00%	(a)	All	All Programs
Operating Rate	7/1/2022	6/30/2023	4.00%	(b)	All	All Programs

Basis for Application

- a) Direct salaries, wages and fringe benefits
- b) Direct materials and supplies, services, travel, and up to the first \$25,000 of each subaward (regardless of the period of performance of the subawards under the award) and up to the first \$200,000 of each contract per fiscal year. (\$8,000 indirect cost cap per contract each fiscal year). *Excludes* direct salaries and fringe benefits, equipment, capital expenditures, rental costs, participant support costs, and the portion of each subaward in excess of \$25,000.

Treatment of Fringe Benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs and charged in accordance with rates established by the State.

SECTION II: GENERAL

A. **LIMITATIONS:** The rates in this Agreement are subject to any statutory and administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the department/agency or allocated to the department/agency by an approved cost allocation plan were included in the indirect cost pool as finally accepted; such costs are legal obligations of the department/agency and are allowable under governing cost principles; (2) The same costs that have been treated as indirect costs have not been claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the department/agency which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

State of Montana
Department of Environmental Quality
Helena, Montana

Page 2 of 2

B. CHANGES. The fixed rate contained in this agreement is based on the organizational structure and the accounting system in effect at the time the proposal was submitted. Changes in the organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rate in this agreement, require the prior approval of the authorized representative of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowances.

C. THE FIXED RATE contained in this agreement is based on an estimate of the cost which will be incurred during the period for which the rate applies. When the actual costs for such a period have been determined, an adjustment will be made in the negotiation following such determination to compensate for the difference between the cost used to establish the fixed rate and that which would have been used were the actual costs known at the time.

D. NOTIFICATION TO FEDERAL AGENCIES: Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

E. SPECIAL REMARKS: Please retain a copy for your records.

ACCEPTANCE

The undersigned official warrants
that he/she has the proper authority
to execute this agreement on
the behalf of the State Agency:

By the Federal Agency:

DocuSigned by:

James M. Fehr

C820D2E886C746F

(Signature)

James M. Fehr

(Name)

Deputy Director

(Title)

MT Dept. of Environmental Quality

(Agency)

02/22/2022

(Date)

JACQUELINE SMITH

Digitally signed by JACQUELINE
SMITH
Date: 2022.02.18 15:42:53 -05'00'

(Signature)

Jacqueline Smith, Rate Negotiator
National Policy, Training and
Compliance Division
U.S. Environmental Protection Agency

Negotiated by: Jacqueline Smith
Telephone: (202) 564-5055



February 22, 2022

To the Montana DEQ:

This letter of support formalizes our agreement to partner with you on your Enhanced Air Quality Monitoring for Communities Grant Application.

Air pollution in Montana is an underappreciated environmental issue, whether it be from exposures to residential wood smoke, agricultural / industrial-related emissions, or the emerging threat of wildland forest fire smoke that impacts our rural communities each summer for extended periods of time. As part of our Research Education on Air and Cardiovascular Health (REACH) program, we partner with schools in rural parts of Montana to educate students, teachers, and their families about air pollution exposures impacting their communities, as well as providing them with knowledge about things they can do reduce air pollution exposures within their home and school environments. We are excited to partner with Montana DEQ to expand this initiative, providing opportunities to directly address health disparities related to air pollution throughout rural and tribal parts of Montana.

As part of this project, we look forward to working directly with you in:

- Facilitating the placement of DEQ monitors in current REACH schools.
- Assisting DEQ in recruiting new schools throughout rural and tribal areas of Montana for monitor placement.
- Assisting DEQ in supporting the monitoring network, including development a stringent Quality Assurance/Quality Control program at each site.
- Assisting DEQ in data analysis, and communicating findings back to the respective schools and communities.
- Facilitating student research projects at each site, allowing students to explore air pollution issues of concern in their own communities.

We are excited about this opportunity to partner with DEQ on this important project, and look forward to working with DEQ as we raise awareness about air pollution and ways of addressing air pollution problems in rural and tribal areas throughout the state.

Please contact me if you have any questions.

A handwritten signature in black ink that reads "Tony Ward". The signature is stylized, with a large, sweeping "T" and a cursive "Ward".

Tony Ward, PhD
Professor and Chair
School of Public and Community Health Sciences
University of Montana
Skaggs Building Room 176
Missoula, MT 59812
406-243-4092
Tony.ward@umontana.edu

College of Health
School of Public and Community Health Sciences

Skaggs Building 177 | Missoula, MT 59812 | t: (406) 243-2571 | f: (406) 243-4209 | e: publichealth@umontana.edu



MONTANA HIGH SCHOOL ASSOCIATION

PROMOTING SUCCESS ON THE COURT, ON THE FIELD, ON STAGE
AND EVERYWHERE ELSE UNDER THE BIG SKY SINCE 1921.

March 1, 2022

To the Montana DEQ:

This letter of support formalizes Montana High School Association's (MHSA) agreement to partner with DEQ on the proposed collaborative monitoring project outlined in the Enhanced Air Quality Monitoring for Communities Grant Application.

Poor air quality, as a result of wildfires, is becoming a more common occurrence in Montana, often lasting into the fall. This has had a significant impact on summer and fall athletic practices and competitions across the state. Awareness of air quality impacts on high school athletes is a priority for MHSA. Access to timely, accurate, local monitoring data is essential to administrators, athletic directors, and coaches that must make the difficult decision to cancel practices and events.

Athletes are at increased risk from fine particulate matter during exercise. Smoke particles are very small and can be inhaled deep into lung tissue. Elevated respiration rate during exercise increases the amount of air being inhaled over the duration of a practice or contest. In addition, a large fraction of air is inhaled through the mouth during exercise, bypassing nasal filtration, allowing more polluted air to move deeper into the lungs. Further, athletic events and practices are often held outdoors for prolonged periods of time which can lead to increased exposure.

We are excited to partner with DEQ to expand the ambient air quality monitoring network throughout Montana.

As part of this project, we look forward to working directly with you in:

- Facilitating the placement of monitors/sensors in Montana high schools.
- Assisting DEQ in supporting the monitoring network, including educating school officials on how to operate monitors.
- Assisting DEQ in educating school officials on what the monitoring data represents and how it can be used to help them make decisions.
- Facilitate and support DEQ's outreach and education among teachers and classrooms.

We are excited to partner with DEQ on this important project and look forward to working toward a more robust monitoring network that allows our school officials to make the best decisions for our student athletes.

Please contact me if you have any questions.

Sincerely,

Mark Beckman
Executive Director

Quality Assurance Statement

Quality assurance (QA) and quality control (QC) practices applied during the proposed project will follow Montana's existing statewide ambient air monitoring Quality Assurance Project Plan (QAPP). Montana's QAPP meets and exceeds the requirements of 2 CFR §1500.12, which outlines QA requirements for assistance agreements that involve environmentally related data operations and collection. This statement summarizes DEQ's strategy and approach for ensuring quality and representativeness of data obtained in the context of the proposed project.

Employ Instruments of Nationally-Established and Recognized Quality

Data generated from the expanded PM_{2.5} monitoring network can be classified based on equipment type and according to the following tiered quality hierarchy:

1. **Highest Quality: Existing PM_{2.5} FEMs and proposed Met One FEM BAM-1022s.** Montana's existing network consists of Met One 1020 Federal Equivalent Method (FEM) Beta Attenuation Monitors (BAMs) and Thermo 5014i FEM BAMs, quality assured via BGI PQ200 Federal Reference Method (FRM) samplers. As discussed in Section 1 of the project narrative, DEQ proposes to add 6 FEM BAM-1022 instruments to the state's monitoring network. The BAM-1022s are EPA-designated Reference Method Equivalents; and provide high quality data, along with the advantages of being low maintenance, portable, and requiring a minimal footprint. FEM-grade data provides the fundamental basis for QA of the entire network.
2. **Very Good Quality: Existing and proposed non-FEM Met One EBAMs.** Thirteen non-FEM portable EBAM instruments will be added to the state's monitoring network. Met One EBAMs are EPA recognized and are widely used and relied upon particularly in wildfire-related monitoring and have been used with very good success by DEQ. A high level of comparability has been observed between portable EBAMS and FEM instruments during internal co-location studies.
3. **Personal Sensor Grade: PurpleAir Sensors.** 164 PurpleAir PA-II or PA-II-SD real-time sensors will be deployed in strategic locations around the state. These sensors are EPA-recognized as demonstrated by their inclusion on the AirNow Fire and Smoke Map. When produced data is corrected according to EPA algorithms, the PurpleAir sensors provide a low-cost, low maintenance means to communicate PM_{2.5} conditions to a large number of communities, schools, and neighborhoods. The PurpleAir sensors are also key to planned outreach and educational programming.

As described in Section 1 of the project narrative, QA was one of the criteria used to determine the proposed locations and priorities for additional PM_{2.5} instrumentation. The proposed network expansion relies on a tiered quality hierarchy. In the proposed network design, a small number of FEM instruments are evenly distributed spatially; data of the highest quality produced by the FEMs underpins data from monitors and sensors with less rigorous capabilities and QA requirements. A graphical depiction of the three-tiered QA hierarchy approach is shown in Figure 1 (below).

Strategic spatial assignment of monitor types within the hierarchy provides levels of increasingly authoritative data that can be used to assess the accuracy and temporal representativeness of values collected by individual monitors/sensors lower on the QA pyramid. Section 1 of the project narrative includes a discussion of the process used to spatially assign monitor types according to this hierarchy.

Spatial proximity analysis performed using the proposed monitor/sensor locations indicates no PurpleAir monitor would be more than 50 miles from a higher tier monitor in the proposed scheme.

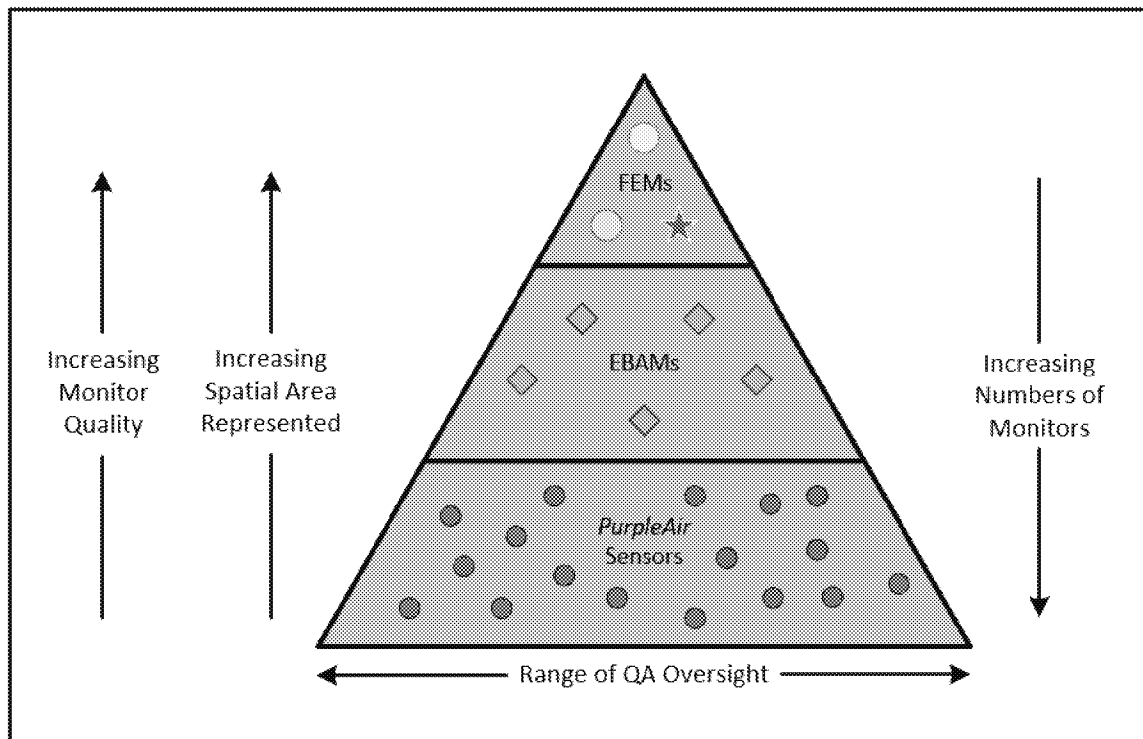


Figure 1. QA Hierarchy

Employ Recognized and Approved QA Practices

DEQ will continue to employ approved QA practices including those essential to assessing data precision, accuracy, representativeness, completeness and comparability; and those for performing data review, field operations, and audits. Montana's QA practices are documented in the State of Montana QAPP (see: [Montana 2017 QAPP](#)) and approved State of Montana Standard Operating Procedures (SOPs) for ambient air monitoring. Montana's QAPP has been determined to meet the requirements of Title 40 Protection of Environment, Code of Federal Regulations Part 58, Appendix A – Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards and the EPA Quality Assurance Handbook for Air Pollution Measurement Systems. Updates to the QAPP required to cover new scope of work described in this proposal, for example, additional SOPs, will be incorporated upon award.

DEQ will continue to operate non-FEM EBAMS according to manufacturer manuals and instructions following best operating procedures.

PurpleAir distribution coordinated by DEQ will include a start-up kit of resources and links for proper siting, installation, set-up, use and maintenance of the sensor. DEQ will also provide additional guidance and outreach, training, and support on an individual or as-needed basis.

Employ Recognized QA/QC Oversight

QA/QC management of this project is assigned to Mr. Hoby Rash, DEQ Air Quality Scientist. Mr. Rash has several decades of air monitoring and air quality management experience, including management of Montana's Ambient Air Monitoring Program. His resume is part of the Project Team Biography attachment to this application.

Kelly Dorsi, Ph.D.

Project Manager

Helena, Montana

Ex. 6 Personal Privacy (PP)

kelly.dorsi@mt.gov

Ex. 6 Personal Privacy (PP)

SUMMARY

Atmospheric scientist with experience in state government, academia and the private sector. Technical and leadership background includes project management, industrial testing and compliance, quality assurance and quality control oversight, supervisory roles, academic research, publications, grant writing and fieldwork. Regularly engages with citizens, collaborative partners, clients, lawyers, state and federal regulatory agencies.

PROFESSIONAL EXPERIENCE

Air Quality Meteorologist

Montana Department of Environmental Quality, Helena, Montana

SEPTEMBER 2021 – PRESENT

- Provides guidance in air pollution meteorology including dispersion forecasting for the department, other state and federal agencies, major open burning permit holders and local air quality programs.
- Analyzes air pollution events for public notification, documentation and justification of exceptional events.
- Consults with the Monitoring Services Section Supervisor and industrial facilities on air monitoring network design and placement of air monitors and meteorology equipment.
- Oversees dispersion forecasting and open burning restriction decisions for the Montana Smoke Management Program. Serves as state smoke coordinator from December through February.
- Manages projects in the Analysis and Planning Section, ranging from regulatory reform to leading process improvement efforts.

Quality Manager, Reporting Supervisor, Project Manager

Bison Engineering, Inc., Helena, Montana

JANUARY 2015 – SEPTEMBER 2021

- Secured and maintained employer's status as an accredited air emissions testing body.
- Oversaw quality of work practice/product across three branch locations as named Quality Manager.
- Managed and coordinated reporting deadlines/workload for three branch locations as Reporting Team Supervisor.
- Project manager and coordinator for the company's most important clients and highest complexity jobs.
- Extensive field emissions testing experience at diverse industrial facilities (e.g., power plants, oil and gas sites, production facilities for lime and cement, metals fabrication, mining, fiberglass, battery plastics and wood products).
- Developed original technical resources including automated spreadsheets for data analysis, report templates, style guides and standard operating procedures for source testing and reporting.
- Served as invited speaker at industrial source testing events (e.g., Invited speaker, Technical and Analytical Considerations, Maul Foster and Alongi's Cleaner Air Oregon Workshop, Portland, Oregon, January 23rd, 2019; Invited Speaker, PNWIS 2020 Professional Development Series: Source Testing and Observation, Session 2, October 28, 2020).
- Wrote grant proposals that were successfully funded and managed resulting contracts.
- Served as United States Department of State/Environmental Protection Agency fellow advisor to the US Embassy in Bahrain, in addition to standard work responsibilities, from October 2016-2018.

PROJECT MANAGEMENT HIGHLIGHTS

Bechtel National, Inc.

Richland, Washington

2018 - SEPTEMBER 2021

Secured and managed Bison Engineering's subcontract with Bechtel National, Inc. for source testing at the Hanford Nuclear Site near Richland, WA. Bechtel serves as the prime contractor for management of the site under the Department of Energy. Served as the project manager for all source tests conducted.

Hollingsworth & Vose

Corvallis, Oregon

2016 - SEPTEMBER 2021

Served as the project manager and source test coordinator for this glass manufacturing plant. Provided source testing support through a significant plant overhaul, construction project and permit modification.

ENTEK International, LLC

Lebanon, Oregon

2018 - SEPTEMBER 2021

Served as client project coordinator and conducted annual compliance testing at ENTEK's battery separator manufacturing facility located in Lebanon, OR.

PCC Structurals, Inc.

Portland, Oregon

2016 - SEPTEMBER 2021

Served as the client coordinator and conducted any source testing that the client required at their Portland, OR facility for manufacturing custom cast metal parts.

Malarkey Roofing Products

Portland, Oregon

2018 - SEPTEMBER 2021

Served as client coordinator and conducted compliance or informational source testing. Provided source testing support and advice during the installation of new control technology at their asphalt shingle manufacturing plant.

Missoula Fire Sciences Lab

Missoula, Montana

2016 - 2018

Served as the project manager for two collaborative research projects conducted at the Missoula Fire Sciences Laboratory as a subcontractor to Environmental Research Group under EPA.

EDUCATION

Ph.d. Atmospheric and Oceanic Science **December 2011**

University of Colorado, Boulder, Colorado

M.S. Atmospheric and Oceanic Science **December 2008**

University of Colorado, Boulder, Colorado

B.A. Chemistry; Russian and Central European area Studies **May 2006**

St. Olaf College, Northfield, Minnesota

PROFESSIONAL AFFILIATIONS AND TRAINING

Source Evaluation Society Member

Certified Visible Emissions Evaluator for EPA Method 9

Hazardous Waste Operations and Emergency Response training (40 hr.)

Mine Safety and Health Administrations (40 hr.)

Hoby Rash

Air Quality Scientist

Helena, Montana | Ex. 6 Personal Privacy (PP) | hrash@mt.gov

SUMMARY

Professional Scientist with extensive experience in air quality investigation and resource management. Strong and diverse experience with scientific principles, practices, and technology applications. Recognized, experienced communicator and instructor. Continual achievement in process analysis, efficiency improvement, and quality control. A career of understanding and implementing statutes, rules, and guidance from the diverse perspectives of industry, consulting services, regulator, and citizen. Strong GIS and applied computer systems background.

PROFESSIONAL EXPERIENCE

Montana Department of Environmental Quality, Helena, Montana

❖ **Air Quality Scientist, Air Research and Monitoring Section**

- Performance of Quality Assurance audits of all of Montana's ambient air monitoring equipment and locations.
- Operation and data review of NCore monitoring station.
- Innovator and developer of web and GIS based tools to communicate air quality information to the public.

❖ **Supervisor, Air Field Services (Compliance) Section**

- Managed staff and processes to evaluate and ensure industrial facilities across Montana operate in compliance with air quality rules, permit requirements, and operating specifications.
- Invested in ongoing interaction with operators of a wide variety of industrial facilities.
- Directed research into and correct application of state and federal rules, permit conditions, and consent decrees.
- Maintained a collaborative relationship with federal EPA and county partners.
- Provided compliance assistance and education. Pursue enforcement and corrective action where necessary to ensure ongoing compliance.

❖ **Program Manager, Air Permitting and Compliance Assistance Program**

- Oversaw three Air Quality Sections providing permitting and compliance services to all applicable industrial and upstream oil and gas facilities statewide in Montana.
- Coached, developed, and lead three section supervisors who managed 11 engineers, 10 scientists, and two to three college interns to personal and professional achievement. Recruited and hired professional staff.
- Ensured excellence in work products and processes; emphasizing positive, helpful interaction with all customers, including direct stakeholders and members of the public. Ensured continuous performance within the agency mission.
- Developed, pilot-tested, and implemented an innovative program for employee professional development and compensation, now adopted as the standard across the agency.
- Researched, developed, and improved business processes for the performance of the Program's functions.

❖ **Supervisor, Air Research and Monitoring Section**

- Leadership of technical specialists in the placement, operation, maintenance, and quality assurance of advanced instrumentation to measure and report concentrations of pollutants in the ambient air.
- Maintained a budget in the hundreds of thousands of dollars per year from a variety of funding sources.
- Initiated and oversaw the development of a digital communication network for data collection from, and remote operation of, ambient air monitoring stations across Montana. Initiated and oversaw the transformation to an enterprise data management and reporting system.

Consulting Environmental Scientist, Red Bluff California

- Professional services to conduct on-site testing and related guidance to clients on emissions of volatile, semi-volatile, and odor-causing compounds into the ambient air at a wide array of military, commercial, industrial, wastewater, residential, agricultural, and hazardous waste sites located across the United States.

Senior Environmental Scientist, Sierra Pacific Power Company, Reno, NV

- Development and implementation of corporate-wide programs for comprehensive environmental responsibility and compliance. Primary focus on air, but additional experience in water, hazardous waste, and ecological media.

EDUCATION

Engineering studies, LeTourneau University, Longview Texas

B.S. Biology, *summa cum laude*, Los Angeles Baptist College, Newhall, CA

PROFESSIONAL AFFILIATIONS AND TRAINING

ESRI GIS Training in Online, Enterprise Portal, and Pro Platforms

HAZWOPER 40-hour Certification

Green Belt Certified

Carl J. Anderson

Air Quality Monitoring Coordinator

1520 E. 6th Ave Helena, Montana Ex. 6 Personal Privacy (PP) carl.anderson@mt.gov

SUMMARY

Equipment-oriented air quality analyst experienced with operating and maintaining a statewide air monitoring network. Reliable, independent, thorough, and personable. Proficiency with multiple equipment genre and dataset management. Enjoys travel.

PROFESSIONAL EXPERIENCE

Physical Scientist

Montana Department of Environmental Quality, Helena, Montana

JUNE 2018 – PRESENT

- Operates and maintains the full breadth of Montana's particulate air monitoring equipment, collect sample media and manages network data.
- Calibrates reference monitoring equipment to EPA standards.
- Maintains monitoring equipment shelters and sites, structurally and mechanically.

Environmental Analyst IV

State of Vermont Department of Environmental Conservation, Montpelier, Vermont

OCTOBER 2004 – JUNE 2010

- Operated the full breadth of Vermont DEC's air monitoring equipment, collected sample media and managed network data.
- Calibrated reference monitoring equipment to EPA standards.
- Proficiency with operation, maintenance, calibration, and referencing of all equipment at NCORE, SLAMS, and CSN/STN sites.

CAREER HIGHLIGHTS

Multiple Avian and Bat Biologist Positions

Field Based Wildlife Biologist/Multiple locations

JUNE 2010 - JUNE 2018

Bird and Bat Biologist positions with multiple firms including five years with Biodiversity Research Institute, Portland, Maine. Responsible for design, management, collection, and analyses of large datasets, including bat acoustic detections, avian telemetry data, etc.. Field supervision of crews of up to 12 personnel, performing wildlife capture, tracking, and habitat characterization.

IBM/ Eastman Kodak

Field Service Engineer/ Engineering Technician

NOVEMBER 1984 - DECEMBER 1996

Engineering and Field Service support of complex manufacturing and field-based electronic equipment, including precision semi-conductor photo-lithography equipment, business imaging systems, and commercial print-shop duplicators.

EDUCATION

M.S. Wildlife and Fisheries Biology February 2004

University of Vermont, Burlington, Vermont

B.S. Integrated Natural Resources May 1997

University of Vermont, Burlington, Vermont

A.A.S. Electronics Technology May 1980

Southern Maine Vocational Technical Institute, So. Portland, Maine

PROFESSIONAL AFFILIATIONS AND TRAINING

HUET Helicopter Underwater Escape Training

Wilderness-based First Aid/ CPR training

Hazardous Waste Operations and Emergency Response training (40 hr.)

Montana Driver In-Vehicle Education Course (DRIVE)

Steven Zehntner

Air Monitoring Lead Worker

Helena, Montana | Ex. 6 Personal Privacy (PP) | szehntner@mt.gov

SUMMARY

I am by training a chemist and chemical engineer. During college summer breaks, I worked as a heavy equipment mechanics assistant. I spent four years in the US Army as an Ordinance Officer ending my service time as a captain. After leaving the Army, I spent sixteen years working on my family's ranch in Montana. I left the ranch to work for Montana DEQ as an air monitoring specialist. I have worked for the DEQ for the past seventeen years.

PROFESSIONAL EXPERIENCE

Air Monitoring Section Lead Worker

Montana Department of Environmental Quality, Helena, Montana

FEBRUARY 2005 – PRESENT

This position directly implements the functions, goals, and objectives of the Research & Monitoring Services Section on a day-to-day basis. The Lead Worker works closely with the Section Supervisor and Bureau management to define and understand the broad priorities of the section, and works with staff to schedule and carry out the functional details of those priorities. The Lead Worker provides technical assistance, guidance, organization, and training to staff; provides oversight to staff during the Supervisor's absence; and represents the ambient air monitoring interests of the Department to county programs, utilities, landowners and the general public.

Essential Functions include but are not limited to:

- a. Staff Oversight
 - Assigns work tasks to staff and tracks the performance of those tasks to ensure effective and timely implementation.
 - Ensures that required deadlines are established and met throughout the operation of the monitoring network.
 - Trains and oversees staff in the operation of various instrumentation, field duties and responsibilities.
 - Directs and coordinates staff in instrument diagnosis, repair, testing, and maintenance activities.
 - Evaluates overall monitoring network operation and establishes maintenance and repair priorities and activities for the air monitoring section staff.
- b. Senior Instrumentation Technical Expert
 - Coordinates and communicates the correct specification, selection, purchase, application, installation, operation, maintenance, inventory tracking, and repair of various air monitoring equipment instrumentation and associated equipment, including digital communications and data acquisition/manipulation devices.
 - Instructs staff on the complex principles of chemistry, physics and electronics employed in the operation of monitoring instrumentation/equipment.
 - Directs and oversees staff on correct troubleshooting, repair, and maintenance procedures and activities.
 - Researches and communicates to staff, management, and county program personnel the correct application and operation of ambient air monitoring instrumentation, in accordance

with manufacturers and USEPA requirements and any appropriate guidance or recommendations.

- Coordinates equipment and parts inventory to maintain continuity of the monitoring network and sustain data completeness and integrity.
 - Advanced understanding of circuit boards, processors, chips electronic computer hardware and software as applied to monitoring instrumentation.
- c. Monitoring Network Planning and Operation
- Advanced understanding of the USEPA requirements, as defined in 40 CFR 50, 53 and 58, and appropriate guidance with respect to the operation and maintenance of Montana's ambient air monitoring network; including siting criteria, NAAQS compliance, pollutant specific criteria.
 - Advanced ability to provide expert air monitoring network analysis and render meaningful conclusions to AQB management.

Ranch Hand

Zehntner Brothers Ranch, White Sulphur Springs MT

DECEMBER 1986 – APRIL 2000

- Worked with cattle, sheep and horses
- Harvested hay
- Farmed
- Guided hunters

CAREER HIGHLIGHTS

US Army

SEPTEMBER 1982 – NOVEMBER 1986

Commanded an Explosive Ordnance Disposal Detachment.

Zehntner Brothers Ranch

White Sulphur Springs, Montana

DECEMBER 1986 – APRIL 2000

Manager of a remote Montana cattle ranch.

Confederated Tribes of Warm Springs

John Day, Oregon

APRIL 2000 – SEPTEMBER 2003

Ran the water monitoring program for the tribal fisheries department. Carried out research projects and water quality monitoring on critical salmon spawning habitat in the John Day River system.

EDUCATION

B.A. Chemistry June 1980

Florida Southern College Lakeland, Florida

M.S. Chemical Engineering September 1982

Montana State University Bozeman, Montana

Casey Redder

Air Quality Monitoring Coordinator

Helena, Montana | Ex. 6 Personal Privacy (PP) | credder2@mt.gov

SUMMARY

Chemist who specializes in the operation, calibration and maintenance of Montana's statewide network of ambient-level gas analyzers and meteorology sensing instruments.

PROFESSIONAL EXPERIENCE

Air Quality Monitoring Coordinator Gas/Met

Montana Department of Environmental Quality, Helena, Montana

APRIL 2014 – PRESENT

- Repairs and calibrates air monitoring equipment.
- Reviews and implements state and federal statutes, rules, and policies.
- Developed a preventative maintenance schedule to prevent data loss.
- Transitioned from bound paper logbooks to e-logs.

Chemist

Montana Department of Health and Human Services, Helena, Montana

MAY 2008 – APRIL 2014

- Analyzed drinking water for organic pollutants and disinfection byproducts.
- Became an EPA certified lab auditor.
- Built a functioning GC-MS out of spare parts.
- Consulted with DEQ about EPA methods and requirements.
- EPA methodology subject matter expert for water labs around the state.

Tank/Line Tester

Tanknology, Elgin, Illinois

MARCH 2006 – NOVEMBER 2007

- Tested underground fuel lines and tanks for leaks.
- Tested Stage II vapor recovery systems.
- Installed, serviced and provided end user training of Automatic Tank Gauges.
- Worked autonomously in remote locations.
- Maintained truck and tools and testing equipment.

EDUCATION

B.S. Chemistry June 2006

University of Montana, Missoula, MT

PROFESSIONAL AFFILIATIONS AND TRAINING

TAPI Level I training- maintenance and basic troubleshooting of API instruments

TAPI Level II training- advanced troubleshooting and instrument repair

Bo Wilkins

Air Quality Bureau Chief

Helena, Montana Ex. 6 Personal Privacy (PP) | bo.wilkins@mt.gov

SUMMARY

Air quality professional with experience in state government and the private sector. Professional focus on leadership, program development, and project management. Technical background includes air quality testing, quality control, and resource development.

PROFESSIONAL EXPERIENCE

Air Quality Bureau Chief

Montana Department of Environmental Quality, Helena, Montana

AUGUST 2021 – PRESENT

- Provides overall vision, direction, and management to the Air Bureau and programs within.
- Develops innovative approaches and solutions to challenges faced by Bureau programs.
- Engages with stakeholders to cultivate support for Department initiatives.
- Coordinates Bureau activities with those of other bureaus, divisions, and departments.
- Participates in and directs policy initiatives.
- Implements or directs projects of high priority to the Department.

Source Team Coordinator

Bison Engineering, Inc., Helena, Montana

JANUARY 2020 – JULY 2021

- Directed source testing operations for the Helena, MT branch location.
- Provided leadership in systems and operations development, business development, and market growth.
- Managed large-scale and complex projects.
- Contributed to develop and maintenance of quality assurance/quality control measures to maintain the company's American Association for Laboratory Accreditation.
- Trained employees in advanced project management.

Environmental Consultant

Bison Engineering, Inc., Helena, Montana

DECEMBER 2017 – DECEMBER 2020

- Prepared Title V and preconstruction permit applications, including emission inventory, CAM plan and air program analysis.
- Assisted clients with air regulatory compliance.
- Provided source testing compliance assistance.
- Compiled and reviewed source test data and reports.

Air Quality Scientist

Montana Department of Environmental Quality, Helena, Montana

APRIL 2015 – NOVEMBER 2017

- Provided senior level compliance oversight necessary to implement air quality regulations in the state.
- Performed on-site evaluations of industrial facilities, off-site evaluations of reports for determination of compliance with rules and permit conditions.

- Oversaw and managed source test approval and review program.
- Lead on Montana Source Test Protocol and Procedures Manual project.

Environmental Scientist, Project Manager

Aspen Consulting and Testing, Helena, Montana

JUNE 2012 – MARCH 2015

- Provided air quality consulting, testing, and analysis for industrial clients throughout Montana and neighboring states.
- Managed testing teams through a variety of complex source testing campaigns.

EDUCATION

B.S. Environmental Chemistry May 2010

Beloit College, Beloit, Wisconsin

PROFESSIONAL AFFILIATIONS AND TRAINING

Mine Safety and Health Administrations (40 hr.)

Liz Ulrich

Air Quality Planning Supervisor

Helena, Montana | Ex. 6 Personal Privacy (PP) | eulrich2@mt.gov

SUMMARY

Air quality supervisor with 6 years of experience building and motivating dynamic teams. Skilled in program development and implementation, resource management, and stakeholder engagement. Background includes environmental planning, analytical chemistry, and research.

PROFESSIONAL EXPERIENCE

Air Quality Analysis and Planning Services Section Supervisor

Montana Department of Environmental Quality, Helena, Montana

February 2016 - PRESENT

- Evaluates and implements federal and state regulations and policies for the Air Quality Bureau.
- Coordinates the work, supports, motivates, and manages the professional growth of high performing employees.
- Collaborates with both internal and external stakeholders (industry, nongovernmental organizations, federal, state, and local governments, regional planning organizations, and the public) to work together respectfully and effectively.
- Oversees significant air quality projects: redesignation of ten nonattainment areas in Montana to attainment, completion of the Montana Regional Haze State Implementation Plan, development and implementation of state plans to ensure compliance with National Ambient Air Quality Standards (NAAQS), application of the Montana Smoke Management Plan (includes wildfire impacts, prescribed fire program, and open burn program).

Air Quality Planner

Montana Department of Environmental Quality, Helena, Montana

December 2013 - February 2014

- Collaborated with DEQ legal staff and stakeholders to develop new or modify existing state rules.
- Composed and implemented federal plans at the state level.
- Researched regulatory and legislative documents to produce legally and technically defensible programs.

Environmental Chemist

Montana Department of Health and Human Services, Helena, Montana

January 2011 - December 2013

Energy Laboratories, Helena, Montana

February 2008 - January 2011

Northern Analytical Laboratories, Billings, Montana

May 2007 - February 2008

- Analyzed volatile and semi-volatile organic compounds in water and soil via GC, GC/MS, HPLC, and LC/MS.
- Evaluated scientific methods and technical data for precision and accuracy.
- Developed procedures to ensure consistency of sample extraction and testing.

EDUCATION

B.S., Biology (minor in Music)

Rocky Mountain College, Billings, Montana (1999)

PROFESSIONAL AFFILIATIONS AND TRAINING

Green Belt Certified

Outward Mindset Program Completion



Tony J. Ward, Ph.D.

School of Public and Community Health Sciences
32 Campus Drive
University of Montana
Missoula, MT 59812

Ph: 406.243.4092
Fa: 406.243.2807
tony.ward@umontana.edu
<http://health.umt.edu/cphr/people/>

EDUCATION:

Ph.D., Chemistry (emphasis in Air Pollution) – The University of Montana (2001).
M.S., Environmental Science (emphasis in Industrial Hygiene) – The University of Houston – Clear Lake (1997).
B.S., Environmental Science (minor in Chemistry) – Sam Houston State University (1993).

PROFESSIONAL APPOINTMENTS:

1994-1996	Air Quality Specialist, Tenerx Corporation, Houston, TX.
1996-1997	Air Quality Specialist, ICF Kaiser Engineers, Houston, TX.
2001-2002	Postdoctoral Fellow, The University of Montana, Center for Environmental Health Sciences (CEHS).
2002-2003	Air Quality Specialist, MFG, Inc., Missoula, MT and Seattle, WA.
2003-2005	Postdoctoral Fellow, The University of Montana, CEHS.
2005-2009	Research Assistant Professor, The University of Montana, CEHS.
2010-2012	Assistant Professor, The University of Montana, CEHS.
2012-2017	Associate Professor, The University of Montana, School of Public and Community Health Sciences.
2017-current	Professor, The University of Montana, School of Public and Community Health Sciences.
2015-current	Chair, The University of Montana, School of Public and Community Health Sciences.

RECENT PUBLICATIONS RELEVANT TO PROPOSED WORK (last 3 years)

Chen, X.-C., Ward, T.J., Cao, J.-J., Lee, S.-C., Lau, N.-C., Yim, S.H.L., and Ho, K.-F., 2019b. Source identification of personal exposure to fine particulate matter (PM_{2.5}) among adult residents of Hong Kong. *Atmospheric Environment*, 218: 116999, 1-14.

Noonan, C.W., Semmens, E.O., Ward, D., Smith, P., Boyer B.B., Erdei, E, Hopkins S.E., Lewis, J, and Ward, T.J., 2020. Wood stove interventions and child respiratory infections in rural

- communities: KidsAir rationale and methods. *Contemporary Clinical Trials*, 89: 105909, 1-7.
- Chen, X.-C, Jahn, H.J., Ward, T.J., Ho, H.C., Luo, M., Engling, G., and Kraemer, A., 2020a. Characteristics and determinants of personal exposure to PM_{2.5} mass and components in adult subjects in the megacity of Guangzhou, China. *Atmospheric Environment*, 224: 117295, 1-14.
- Chen, X.-C, Chuang, H.-C., Ward, T.J., Tian, L., Cao, J.-J, Ho, S.S.-H., Lau, N.-C., Hsiao, T.-C., Yim, S.H.L., and Ho, K.-F., 2020b. Indoor, outdoor, and personal exposure to PM_{2.5} and their bioreactivity among healthy residents of Hong Kong. *Environmental Research*, 188: 109780, 1-13.
- Chen, X.-C, Cao, J.-J, Ward, T.J., Tian, L.-W, Ning, Z., Gali, N.K., Aquilina, N.J., Yim, S.H.-L., Qu, L., and Ho, K.-F., 2020c. Characteristics and toxicological effects of commuter exposure to black carbon and metal components of fine particles (PM_{2.5}) in Hong Kong. *Science of the Total Environment*, 742: 140501, 1-12.
- Chen, X.-C., Chuang, H.-C., Ward, T.J., Sarkar, C., Webster, C., Cao, J.-J., Hsiao, T.-C., and Ho, K.-F., 2021. Toxicological effects of personal exposure to fine particles in adult residents of Hong Kong. *Environmental Pollution*, 275: 116633.
- Walker, E.S., Noonan, C.W., Semmens, E.O., Ware, D., Smith, P., Boyer, B.B., Erdei, E., Hopkins, S.E., Lewis, J., Belcourt, A., and Ward, T.J., 2021. Indoor fine particulate matter and demographic, household, and wood stove characteristics among rural US homes heated with wood fuel. *Indoor Air*, 31(4): 1109-1124.
- Taylor, B., Hester, C., Kiley, A., Jones, D., Coe, M., and Ward, T., 2021. The REACH program brings science practices to the science classroom: a teacher's perspective – *Connected Science Learning*, November-December, Volume 3, Issue 6.
- Chen, X.-C., Ward, T.J., Sarkar, C., Ho, K.-F., and Webster, C., 2021. Characteristics and health risks of personal exposure to particle-bound PAHs: from ambient to indoor exposure. *Indoor Air*, <https://doi.org/10.1111/ina.12956>.
- Chen, X.-C., Ward, T.J., Sarkar, C., Webster, C., and Ho, K.-F., 2022. Health risks of adults in Hong Kong related to inhalation of particle-bound heavy metal(loid)s. *Air Quality, Atmosphere & Health*,). <https://doi.org/10.1007/s11869-021-01115-6>.
- Walker, E.S., Semmens, E.O., Belcourt, A., Boyer, B.B., Erdei, E., Graham, J., Hopkins, S.E., Lewis, J., Smith, P., Ware, D., Weiler, E., Ward, T.J., and Noonan, C.W., 2022. Efficacy of air filtration and education interventions on indoor fine particulate matter and child lower respiratory tract infections among rural US homes heated with wood stoves: results from the KidsAIR randomized trial. *Environmental Health Perspectives* – *in press*.

Manifest for Grant Application # GRANT13579798

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 24680 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16012 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24162 bytes)

3. Form SF424A-V1.0.pdf (size 22851 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 22731 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 15916 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37285 bytes)

Attachments Included in Zip File (total 5):

1. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1235-MT DEQ Project Narrative.pdf application/pdf (size 1084912 bytes)

2. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1237- Partnership Letters.pdf application/pdf (size 203026 bytes)

3. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1236- Project Team Biographies.pdf application/pdf (size 527061 bytes)

4. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1238- Quality Assurance Statement.pdf application/pdf (size 180281 bytes)

5. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1234-MT DEQ FY 2023 IDC Rate Agreement.pdf application/pdf (size 311616 bytes)

Big Sky Community Air Initiative

Enhanced Air Quality Monitoring for Communities Grant Application

RFA Number: EPA-OAR-OAQPS-22-01

Applicant Organization & Information:

- (1) Montana Department of Environmental Quality, Air Bureau
1520 E 6th Avenue, Helena, MT 59601
Dr. Kelly Dorsi, 406-444-0283, kelly.dorsi@mt.gov
DUNS number: 1124816480000
Set-aside: no set-aside preference

Montana Department of Environmental Quality (DEQ) is the state agency charged with maintaining and improving a clean and healthful environment. Our mission is "to champion a healthy environment for a thriving Montana" by protecting public health and maintaining Montana's unparalleled quality of life for current and future generations. DEQ accomplishes this by closely monitoring environmental conditions and taking proactive measures to preserve and improve the quality of the state's natural resources.

Project Partner Organizations:

- (1) Research Education on Air and Cardiovascular Health (REACH)
School of Public and Community Health Sciences, University of Montana, Missoula, MT
Dr. Tony Ward, 406-243-4092, tony.ward@mso.umt.edu
- (2) Montana High School Association (MHSA)
1 South Dakota Avenue, Helena, MT
Mark Beckman, 406-442-6010, mbeckman@mhsa.org

Project location: Montana, USA

Project period: 3 years from the project start date (estimated Nov. 2022 – Nov. 2025)

Target pollutant: Particulate matter ≤ 2.5 micrometers aerodynamic diameter (PM_{2.5})

Project Description:

This proposal presents DEQ's plan to improve our statewide PM_{2.5} monitoring network through installation of additional stations and sensors in key locations, including in communities where air quality information is not currently available. As the duration and severity of wildfires increase, and the number of smoke-impacted days rises, DEQ must be able to provide accurate air quality information to residents. Our proposal focuses on PM_{2.5}, the pollutant of greatest threat to our state's population. The proposal relies on community engagement through partnerships with key organizations that have established ties to rural and tribal populations. The plan is underpinned by DEQ's proven ability to maintain a robust air quality monitoring network over a large geographic area.

Budget Summary:

EPA FUNDING REQUESTED	TOTAL PROJECT COST
\$452,871	\$452,871

Section 1 – Project Summary and Approach

A. Overall Project

From prolonged wildfires, to woodstove use and prescribed burning, “smoke season” is now a year-round reality for Montanans. In Montana smoke concentrations may vary greatly on small spatial and temporal scales. This variability, and resulting information about community health impacts, are not effectively captured by our existing low-density air monitoring network.

We propose to address spatial limitations in our existing network by installing additional monitoring stations and sensors in key locations, particularly in communities where air quality information is not currently available. Our proposal focuses on PM_{2.5}, the pollutant of greatest threat to our state's population. The proposal is underpinned by DEQ's proven ability to maintain a robust air quality monitoring network over a large geographic area. Awarded funds would be used to:

- 1) Expand Montana's existing statewide air monitoring network, with an emphasis on increasing coverage for under-represented and vulnerable populations;
- 2) Foster lasting partnerships with several named community organizations while working together to establish new partnerships, and to enhance community outreach and education;
- 3) Increase community air quality awareness and create resources and tools that enable interested individuals and organizations to use low-cost air quality sensors in support of citizen science.

Data from the network will be made publicly available on a central Global Information System (GIS) platform, empowering the public to monitor and respond to air quality conditions. Data will also be used in community education and in support of regulatory decision-making/reform.

This proposal describes a path for transforming Montana's air quality network in a way that is practical, maintainable and scalable for the future. The result will be a monitoring network that serves more numerous and more diverse communities in this expansive state.

Approach

We propose to deploy 183 additional sensors and monitors across Montana. To accomplish the goal of engaging underserved populations while also achieving uniform and intentional spatial network growth, a targeted approach to monitor/sensor deployment will be implemented. Potential sites were identified and assigned a numerical priority based on five main factors: locations of partner schools/organizations, tribal lands, communities considered a population priority, and communities considered a geographic priority. Other factors, such as site proximity to existing permanent DEQ monitors, or areas with known air quality and environmental justice issues, were also taken into account. Locations that met more than one of the decision-making criteria were assigned a higher priority.

Three different types of sensors/monitors will be distributed based on practical considerations. These are, Met One Instruments, Inc. (Met One) BAM-1022 Real-Time Beta Attenuation Mass monitors (BAM-1022s), Met One EBAM portable Environmental Beta-Attenuation Mass monitors (EBAMs) and PurpleAir PA-II or PA-II-SD sensors. Six new BAM-1022s will be run in the federal equivalent method (FEM) configuration to provide the highest level of data quality. FEM units are expensive and require extensive human support to maintain the quality assurance (QA) regimen required for data certification. Our second-tier data will come from portable EBAM units that operate on the same beta-attenuation principle as the BAM-1022s. EBAMs have a proven record of being extremely reliable. Specifically, they have been evaluated for high smoke concentrations and performed well⁴. The EBAMs will require less routine QA checks, as they will not be run in a FEM configuration, but still provide robust hourly data that is necessary to meet our goals for spatial and temporal resolution of data in support of health messaging in a smoke-ready network. Based on previous collocation studies⁴, we expect the EBAMs to produce data of comparable quality to that of the FEMs. Thirteen new EBAMs will be deployed as a part of the proposed work.

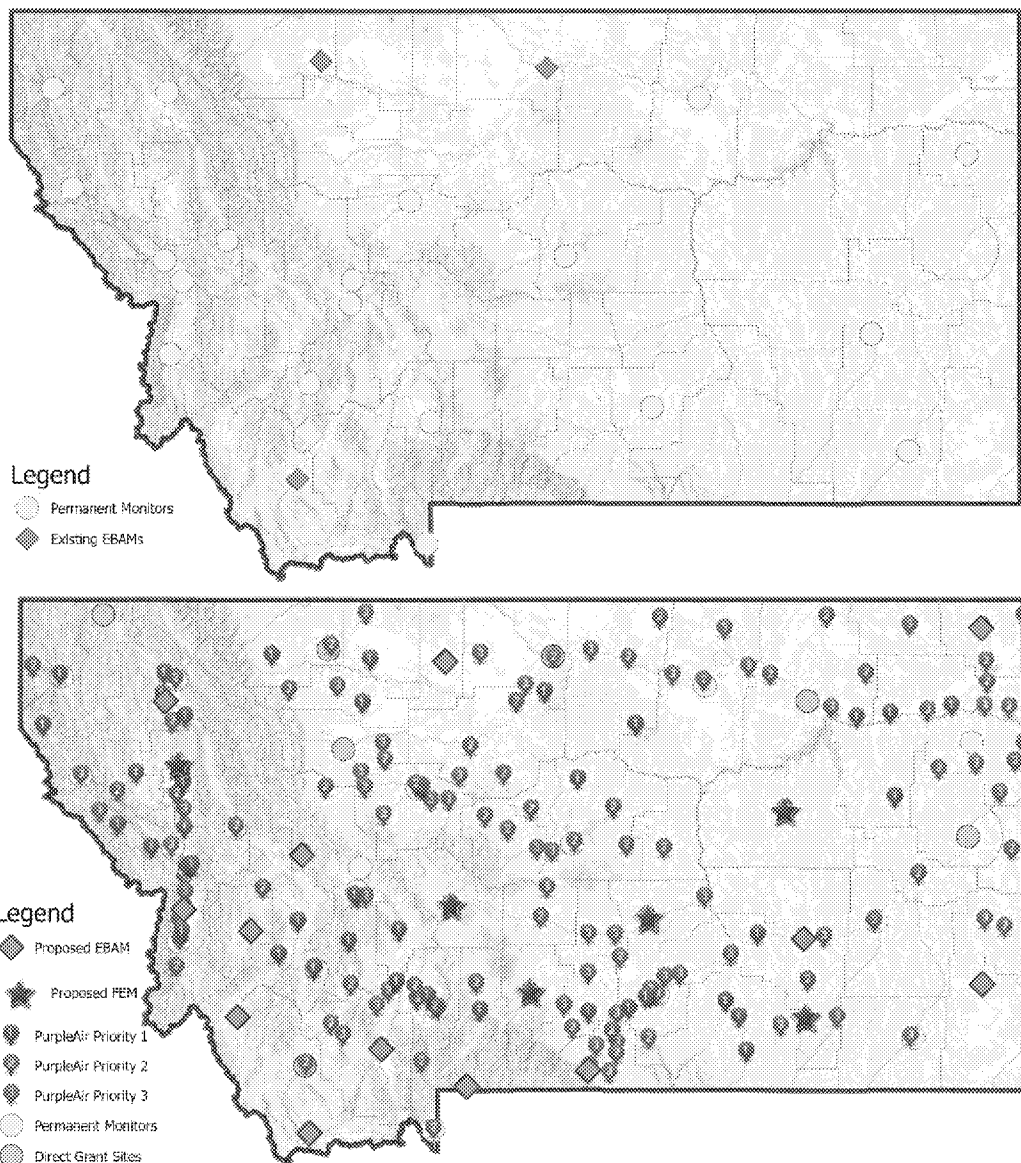


Figure 1. These maps provide a comparison of Montana's statewide air monitoring network before (top) and after (bottom) the proposed project.

The remaining 164 locations have been assigned PurpleAir sensors. PurpleAir sensors provide a less robust data product than FEMs or EBAMs. However, their low cost and minimal support requirements make them a valuable part of our plan to achieve adequate spatial coverage and meet outreach objectives at the community level. If properly sited and maintained, PurpleAir sensors tend to operate sufficiently at particulate concentrations below 300 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). This range captures most days and events annually in Montana. Montana's Today's Air website will display PurpleAir data that has first been corrected by EPA/Forest Service algorithms, which greatly minimizes data quality issues. Further, the PurpleAir sensor data will be supported by strategically positioned FEMs and EBAMs. No PurpleAir sensor will be more than 50 miles from an FEM or EBAM monitor. The PurpleAir sensors requested in this proposal are almost exclusively slated for deployment to schools where they will be used for outreach and educational purposes, and to inform decision making regarding athletic practices and events. In the proposed plan, the benefits of using PurpleAir data to represent and reach currently unrepresented communities outweigh concerns over data quality. A start-up kit of resources and instructions for proper siting, installation, set-up, use and maintenance of the sensor will be included as part of the PurpleAir distribution and installation package.

Figure 1, top map (above), depicts the locations of permanent monitors active as part of Montana's existing ambient air monitoring network. The bottom map shows the proposed network with 183 additional monitor/sensor sites. Proposed FEMs are shown as pink stars and proposed EBAMs are shown as orange diamonds. Sites indicated with red, green and blue balloons are proposed PurpleAir sites; the numbers 1-3 represent the site's assigned priority for installation. The bottom map also includes 8 sites, indicated by aquamarine dots/diamonds, that have been slated to receive monitors through a regional EPA direct grant as part of the American Rescue Plan. Although these monitors have not yet been installed, their planned locations were considered when assigning monitoring sites and planning for this proposal.

B. Project Significance

For more than 50 years, the State of Montana has operated a robust, certified air quality monitoring network. Data from our existing network show that more days annually are affected by wildfire smoke compared to a decade ago. Wildfire season is also becoming longer, with smoke impacts on many communities becoming prolonged. In recent years, more days have been classified statewide in the unhealthy to hazardous health effect categories.

Wildfires and smoke-attributed $PM_{2.5}$ are projected to increase in the coming decades. This is associated with intensifying drought, warming due to climate change and forests heavily over-burdened with wildland fuels^{1,3,8}. Prevailing weather patterns tend to advect smoke into Montana from other western states. Furthermore, 2017 National Emission Inventory (NEI) data⁷ indicate that more than 200,000 tons of $PM_{2.5}$ from wildfires, prescribed burning and woodstoves is generated within our state borders annually.

Figure 2 presents results from a study by O'Dell et al. 2021⁵ demonstrating that Montanans are already subjected to some of the highest concentrations of smoke $PM_{2.5}$ in the United States (US); Montana represents a high outlier for percentage of annual mortalities attributed to smoke exposure.

Clear links have been established between smoke inhalation and adverse health outcomes. Health impacts are reflected in increased doctor visits, outpatient hospital visits and number of asthma inhalers refilled. Wood smoke is known to irritate lungs, cause inflammation, affect the immune system, and increase susceptibility to heart diseases and respiratory infections, including SARS-CoV-2, the virus that causes COVID-19. For example, new studies in Montana have linked summer smoke exposure to influenza cases later that winter. The number of winter influenza cases increases by 16 to 22% for every 1 microgram increase in smoke pollution, resulting in flu seasons three to five times worse than average following a bad fire summer².

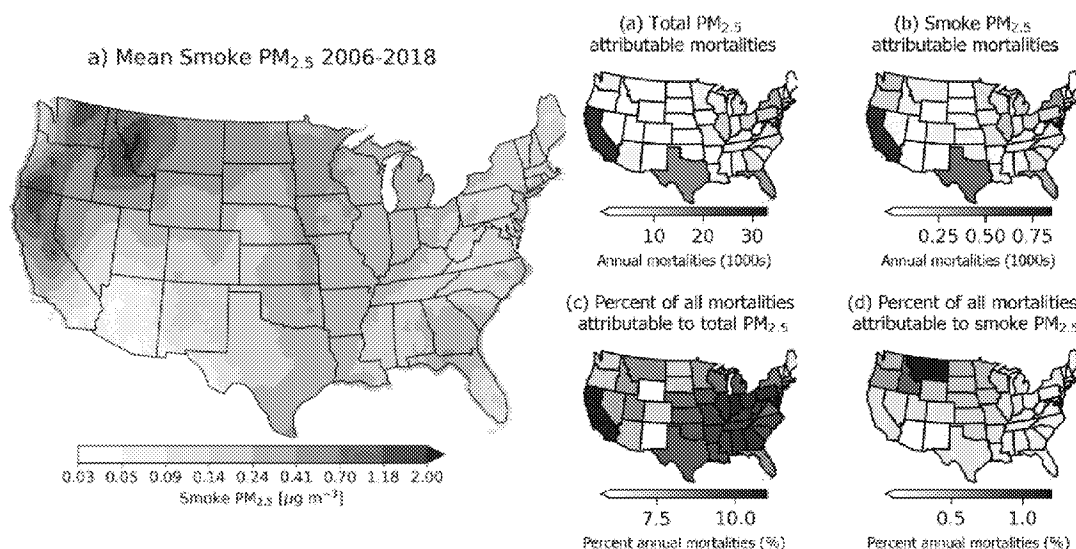


Figure 2. Plots from O'Dell et al. 2021 compare regional smoke concentrations and mortalities attributable to $PM_{2.5}$ and smoke-attributed $PM_{2.5}$.

Unfortunately, we are unable to eliminate smoke from Montana's airsheds entirely. In addition to other air quality management efforts, we aim to empower all Montanans, including those living in our most rural and underserved communities, with knowledge and data currently unavailable to them. The comprehensive plan described here adds

access to current and more spatially relevant data for every county and most communities in Montana. Data resulting from implementation of this project will be used to substantially increase and broaden DEQ's promotion of public air quality awareness, encourage preparedness, support local-scale messaging and decision-making. Armed with air quality data and knowledge about the risks of smoke, Montanans can reduce their exposure to, and health effects associated with, smoke and PM_{2.5}.

Section 2 – Community Involvement

A. Community Partnerships

REACH

One of DEQ's key planned partners is the Research Education on Air and Cardiovascular Health (REACH) Program in Montana. REACH was founded and is led by University of Montana's School of Public and Community Health Sciences. With funding provided by a National Institute of Health Science Education Partnership Award (SEPA), REACH focuses on children growing up in rural and medically underserved communities and native populations that may not have access to educational opportunities that provide them with basic biomedical knowledge or cultivate interest in scientific careers. REACH engages with students through immersive and rigorous student-led research projects focused on PM_{2.5}, cardiovascular health, and population health. REACH began with a single school in Missoula, MT. Now in its eighteenth year of programing, REACH engages with middle and high school students at 40 schools in rural, underserved, and native/tribal areas of Montana, Alaska, Idaho, Hawaii, and New Zealand.

A unified effort as part of the Enhanced Air Quality Monitoring for Communities program will allow both DEQ and REACH to draw on individual areas of expertise while also expanding programing and scope within Montana's rural and underserved communities. The partnership with REACH will allow DEQ to draw upon robust existing relationships they have with schools in rural parts of Montana and on tribal lands. DEQ and REACH will work to site ambient air quality sensors at every REACH school in Montana. Siting of these sensors works toward DEQ's goal of expanding our statewide monitoring network in rural and native communities, while also bolstering/expanding existing REACH programing. Until now, the REACH program focused on indoor air quality. Student research project scopes would be broadened by allowing incorporation of PM_{2.5} observations made outdoors.

DEQ will join and help expand REACH's already established science communication and outreach program by taking part in teacher training and professional development workshops, attending community events and participating in REACH's annual research symposium. Additional sensors and outreach at non-REACH schools will also create opportunities for expanding the REACH program in Montana. REACH's expertise regarding public health messaging will also be an asset as DEQ develops toolkits and resources to include with PurpleAir sensor start-up kits.

MHSA

Partnership discussions between MHSA and DEQ began in fall 2021 when MHSA reached out to DEQ regarding their concerns over poor air quality due to wildfire activity and not having adequate air quality data to inform community-level decisions regarding athletic events and competitions. They observed that wildfire smoke is having increasingly significant negative impacts on summer and fall athletics across the state. They expressed interest in installing PurpleAir sensors at all of their 182-member high schools in Montana. MHSA is an ideal partner for this project because schools are the heart of many Montana rural and tribal communities. Many of these communities have no access to local air quality data.

MHSA schools will host the majority of the 164 PurpleAir sensor sites defined in this project plan. Their participation is key to achieving the community-level spatial coverage DEQ aims for. A handful of high schools have been selected to host higher-grade FEM or EBAM monitors depending on geographic priority and needs. MHSA will facilitate communications between DEQ and member schools for placement of the monitors and sensors. They will also support on-going preservation of the network, for



example, funding replacement of sensors when PurpleAir failures arise. DEQ will purchase and distribute the monitors/sensors described in this proposal and provide support to the schools for initial equipment placement, installation, use and maintenance. DEQ will also educate and inform teachers and school officials on what the data represents with respect to health messaging. MHSA has also agreed to enable outreach and education efforts by DEQ and the REACH program in their schools. For example, allowing DEQ/REACH to provide information and teacher training regarding how the data can be used as a part of student research projects. Monitor and sensor data from the MHSA sites will be made publicly available on DEQ's Today's Air platform, so community members outside of the schools will also benefit from the expanded network.

Letters of support from the REACH program in Montana and MHSA are included separately as the Partnership Letters attachment to this application.

B. Community Engagement

Effective community engagement is essential to the success of this project, and is supported by our named partners. Both REACH and MHSA are well established and trusted in rural Montana communities that may tend to resist outsiders and government entities.

DEQ and our partners understand that effective outreach and engagement of low-income, minority and tribal populations requires respectful, adaptive approaches that empower participant communities. We will develop community-specific messaging and targeted educational materials for different audiences. We will rely on various types of media to reach the public, including written content, social media, audio and visual materials. Web interfaces will have adaptable font size, and translations of written material will be made available as needed. We anticipate working with schools, community centers and public health departments to host in-person meetings and educational events, because these community-cornerstone institutions are familiar, accessible to the mobility-impaired, and distributed across the state. DEQ, REACH and MHSA all regularly host public meetings among diverse subgroups in our population. DEQ public information officers and tribal liaisons will support professional, inclusive, and effective messaging and outreach activities.

Data from monitors and sensors deployed as part of this project will be publicly available to citizens and stakeholders through Montana's Today's Air website. A new version of the Today's Air site, hosted on a GIS platform, will soon be available to both desktop and mobile users. Transition to the new Today's Air platform is set to occur in 2022. Open access to near-real-time air quality data, associated health messaging, and high-resolution maps, will encourage meaningful engagement from the public and allow them to provide well-informed and constructive input and feedback on our program.

Community engagement with our named partners during this initial round of monitor/sensor deployment is only the beginning. We hope that this community monitoring initiative will spark additional awareness and interest so that that new outreach opportunities can be developed beyond the timeline of this award. As we build awareness in our communities, we imagine the community monitoring program will expand to include partnerships with other community and social service organizations, public health agencies, senior citizen groups and more.

Section 3 – Environmental Justice and Underserved Communities

DEQ used EPA's EJScreen dataset⁶ to create project-specific GIS map layers that were overlaid with maps of proposed and existing air monitor/sensor locations. The EJScreen GIS layers were used to help guide DEQ during project inception, development, and monitor/sensor site prioritization.

Montana is the fourth largest state and the third-least densely populated state. In most of Montana's counties, 10-20% of the citizens are living below the poverty level; counties with the highest percentages,

upwards of 30%, are often located on and near tribal lands (American Community Survey 2015-2019 data⁶). Compared to the rest of the country, our population is older (high percentiles for the socioeconomic indicator 'over the age of 64'), living in medically underserved areas with pre-existing conditions such as heart disease and asthma (see Figure 3).

Adverse health and economic impacts from the ongoing COVID-19 pandemic have exacerbated stress on our communities. This combination of factors has left much of our population more susceptible to adverse effects from PM_{2.5} pollution.

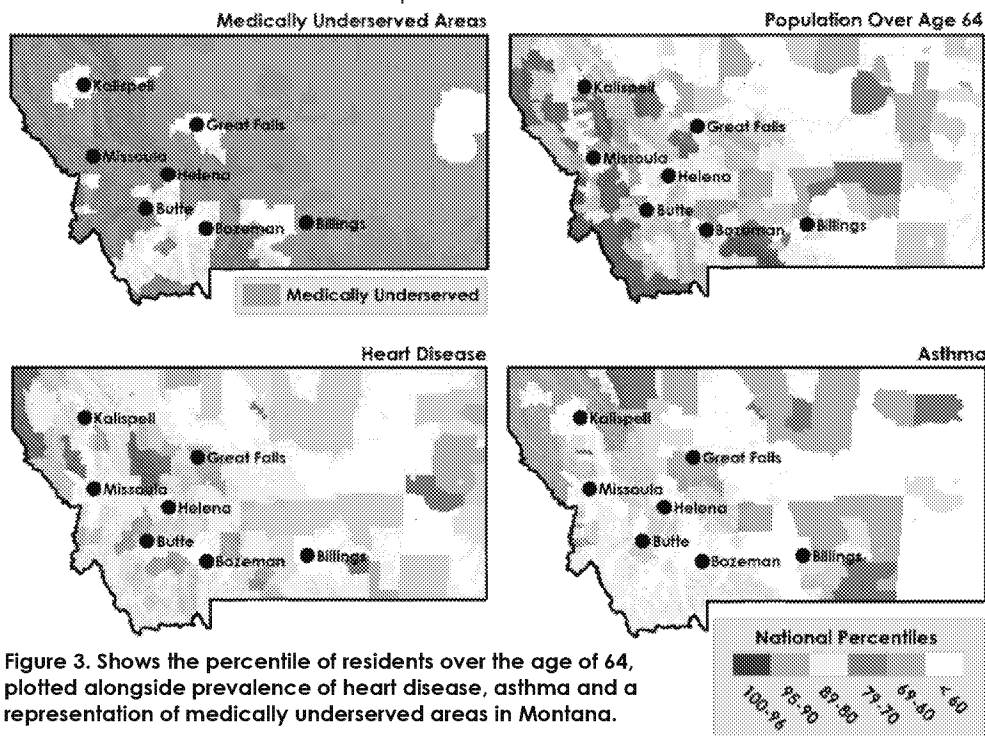


Figure 3. Shows the percentile of residents over the age of 64, plotted alongside prevalence of heart disease, asthma and a representation of medically underserved areas in Montana.

As discussed in Section 2, Montanans are already subjected to some of the highest annual concentrations of smoke-derived PM_{2.5} pollution in the country, and smoke is expected to become more pervasive in the coming decades. Figure 4 shows areas in Montana where citizens may already experience elevated health risks as their potential for exposure to PM_{2.5}, ozone and risk from air toxics is \geq the 80th percentile compared to people living elsewhere in the US.

Rural Montana communities have historically lacked access to adequate air quality monitoring. Funding resources have been inadequate to support community-scale initiatives in our large state. This project will change the situation with respect to air monitoring.

Data from 183 additional air quality sensors, including new instrumentation in every county, 24 new sensors on tribal lands, and 182 on schools, will allow our rural and underserved communities to better identify adverse air quality conditions and adjust behaviors when possible. Outreach and engagement in partnership with MHSA and the REACH program will be used to better understand community

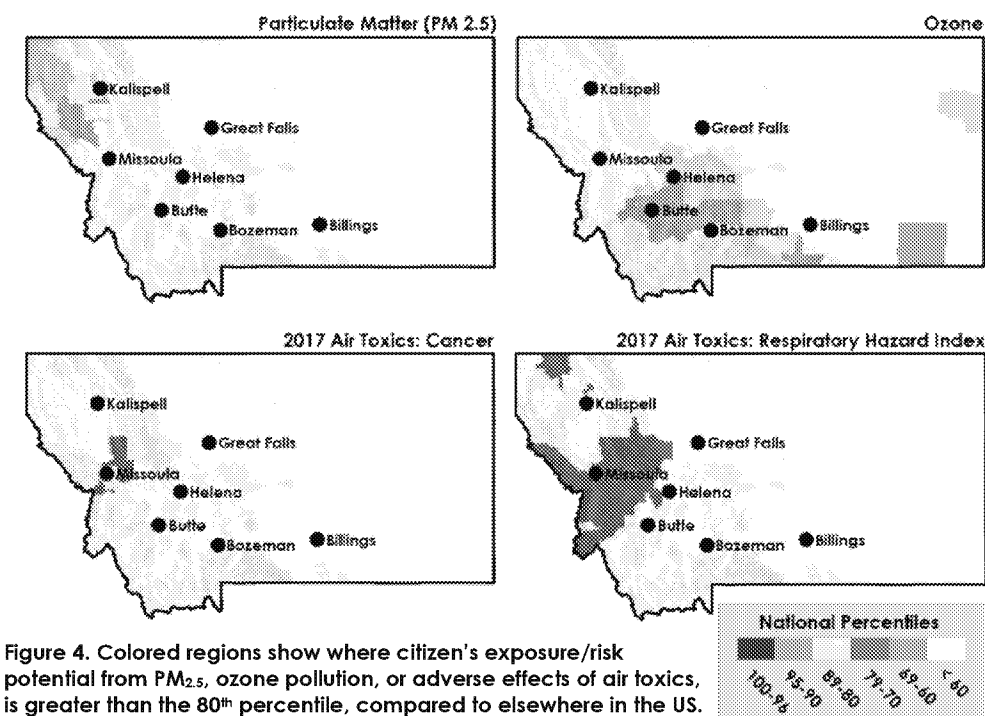


Figure 4. Colored regions show where citizen's exposure/risk potential from PM_{2.5}, ozone pollution, or adverse effects of air toxics, is greater than the 80th percentile, compared to elsewhere in the US.

needs and to provide information about the health impacts of smoke. Pragmatic, community-relevant strategies for reducing smoke exposure in poor air quality periods will be communicated in combination with local partners. Community feedback and monitoring data together will be used by DEQ and partners to better serve Montanans and direct future efforts, planning and reform.

Section 4 – Environmental Results—Outcomes, Outputs and Performance Measures

A. Expected Project Outputs and Outcomes

Expected outputs and outcomes of this project, in and near areas with disproportionate environmental and human health impacts to underserved communities include, but are not limited to, those listed in Appendix A, Table 1.

B. Performance Measures and Plan

Performance measures are listed in Appendix A, Table 1. Tracking of progress towards achieving the expected outputs and outcomes will be conducted by the DEQ Project Manager and air quality monitoring staff, and reported along with quarterly and final reports. Results will be evaluated based on whether the performance measures were successfully met or surpassed according to the 3-year timeline described in Appendix A, Table 2.

C. Timeline and Milestones

Appendix A, Table 2 provides a detailed timeline for the project. Updates on progress towards accomplishing listed tasks and milestones will be given in quarterly and final reports.

Section 5 – Quality Assurance Statement

Please see DEQ's Quality Assurance Statement attachment to this application.

Section 6 – Programmatic Capability and Past Performance

A. Past Performance

Appendix A, Table 3 presents a list of funded grants DEQ performed within the last three years, including notes on their management and completion.

B. Reporting Requirements

All financial and programmatic reports have been successfully completed and submitted on-time. DEQ has satisfied the requirements of their individual programs. Please see additional notes provided in Appendix A, Table 3.

C. Staff Expertise

DEQ has a Research and Monitoring section staffed by career subject-matter experts in ambient air quality monitoring. The Project Team Biographies attachment to this application is comprised of resumes for the DEQ project manager, designated project QA manager and other key personnel and partners.

Section 7 – Budget

A. Budget Detail

Funds requested in support of the proposed project total \$452,871. A detailed breakdown of itemized costs is shown in Appendix A, Table 4. Personnel, fringe benefits, travel costs and indirect charges associated with maintenance and operation of our ambient monitoring network are covered by two other EPA grants (PM-96839001 and BG-99861320; see Table 3 for more details). Therefore, we have not requested funds or cost sharing associated with those categories. DEQ will absorb monthly operational costs and on-going maintenance expenses after the 3-year funding timeline ends.

B. Reasonableness of Costs

Most of the proposed project budget goes towards purchase of monitoring and sensing units themselves. We have included line items for 6 new FEM BAM-1022s, 13 EBAMs and 164 PurpleAir sensors. The FEM BAM-1022s and EBAMs require additional infrastructure and components to make them operational, autonomous and secure. Specifically, the 19 BAM-style units will each be outfitted with cellular modems and web power switches for remote data transmission and autonomous resets. Monthly operational costs budgeted for are electricity, cellular service and BAM glass fiber filter tape.

One time set-up costs for new monitoring sites includes line items for fencing at 9 of the new FEM/EBAM sites, establishing electrical service at 6 sites, and approximately \$200/site for miscellaneous hardware, wiring and parts. Two line items have been added in anticipation of regular maintenance and repairs. We have included a line item for 6 BAM-1022 replacement pumps, one for each new FEM, because the factory pumps that come with new instruments tend to fail in the first 1-2 years. The replacement pumps DEQ uses are more robust and tend to perform better in Montana's harsh wintertime environment. The EBAMs will require routine pump maintenance as well; one pump rebuild kit per new EBAM has been included as a separate line item.

Several other non-equipment related line items listed are 3 years of electrical and cellular service for 19 FEM and EBAM sites and outreach supplies. Outreach funds will be used to develop educational materials for distribution and talks within our rural and tribal communities and schools, and to support presentations that increase public awareness of monitoring data, health information, and available resources.

C. Expenditure of Awarded Funds

Budgeted funds will be dispersed over a 3-year funding period with most expenditures occurring in the first two years. If funding is received in November 2022, we would order capital equipment for 2023 installations immediately. PurpleAir sensors will be installed over a 3-year timeline according to the assigned site priority rankings 1-3. Roughly 50-60 PurpleAir sensors would be purchased and deployed each year over the 3-year funding period. Expenditures for outreach and education are expected to be dispersed mainly in the second and third years of funding, as the first year will be dominated by procurement and equipment installation.

Citations

1. Ford, Bonne, et al. "Future fire impacts on smoke concentrations, visibility, and health in the contiguous United States." *GeoHealth* 2.8 (2018): 229-247.
2. Landguth, Erin L., et al. "The delayed effect of wildfire season particulate matter on subsequent influenza season in a mountain west region of the USA." *Environment international* 139 (2020): 105668.
3. Liu, Jia Coco, et al. "Particulate air pollution from wildfires in the Western US under climate change." *Climatic change* 138.3 (2016): 655-666
4. Mehadi, Ahmed, et al. "Laboratory and field evaluation of real-time and near real-time PM2.5 smoke monitors." *Journal of the Air & Waste Management Association* 70.2 (2020): 158-179.
5. O'Dell, Katelyn, et al. "Estimated mortality and morbidity attributable to smoke plumes in the United States: Not just a western US problem." *GeoHealth* 5.9 (2021): e2021GH000457.
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7. United States Environmental Protection Agency. NEI Report 2017. National Emissions Dashboard. Retrieved: March 4, 2022, from url https://edap.epa.gov/public/extensions/nei_report_2017/dashboard.html#sector-db.
8. Yue, Xu, et al. "Ensemble projections of wildfire activity and carbonaceous aerosol concentrations over the western United States in the mid-21st century." *Atmospheric Environment* 77 (2013): 767-780.

APPENDIX A: TABLES

Table 1. Outputs, Outcomes and Performance Measures

OUTPUTS	PERFORMANCE MEASURES
1. Identification of and quantification of PM _{2.5} pollution in rural, tribal and underserved parts of Montana where data was previously unavailable.	Quarterly and annual reports will include summaries of data from new monitors that have been deployed since the start of the funding period.
2. Deployment of monitors and sensors in our statewide network including in or near tribal and underserved locations in Montana.	The number of new monitors/sensors added to our network will be tracked and reported quarterly and annually as a percentage of progress toward the goal of 183 new sensors being deployed in 3 years.
3. Increase publicly available near-real time monitor/sensor data on our public Today's Air platform.	The number of new monitors/sensors that have been added to Today's Air and are publicly available in near real-time will be reported quarterly and annually to show progress towards the goal of having data from 183 new sensors/monitors publicly available.
4. Create lasting partnerships through joint outreach activities with REACH and MSHA schools.	The number of joint outreach activities conducted with REACH or MSHA will be tracked quarterly and annually.
5. Promotion of partnerships and community involvement through various activities and information exchanges. For examples, participation in REACH annual teacher trainings and research symposiums.	Number of total community outreach activities conducted will be tracked and reported quarterly and annually. Any additional partnerships engaged in will be similarly reported.
SHORT-TERM OUTCOMES	PERFORMANCE MEASURES
1. Increase availability of monitoring data, especially in Montana's most rural locations, to help identify areas with local-scale PM _{2.5} problems and track trends.	Deploy monitors/sensors on a 3-year schedule. Ensure quality data and its availability of data on Today's Air.
2. Increase community awareness through education about health risks associated with PM _{2.5} and smoke.	See an increase in the number of hits to the Today's Air site.
3. Give citizens access to more local-scale data and tools that increase their understanding of risks posed by smoke and PM _{2.5} .	See an increase in the number of hits to the Today's Air site. Track number of written, electronic, and in-person communications and demonstrations performed quarterly.
4. Introduce students in Montana to the scientific method through student-led research projects using actual data.	Track participation in REACH- and MSHA-sponsored activities.
INTERMEDIATE OUTCOMES	PERFORMANCE MEASURES
1. MSHA will take action to adjust sporting events and practices at high schools.	Obtain/report feedback from MSHA at least annually after fall burning season. Ensure they have the materials and understanding of what their local air quality data means.
2. Inspire citizen action to mitigate exposure.	Continuous enhancement and promotion of desktop and portable versions of Today's Air. Track number of hits to the Today's Air site.
3. Inform policy and decision-making by DEQ.	DEQ management will also receive quarterly and annual reports from monitors/sensors.
4. The additional monitoring data will inform the timing of prescribed burning.	Use data by smoke coordinators, federal land managers and local burners to encourage safe and responsible burning practices.
5. More of Montana's students will be inspired to pursue scientific careers.	Participation in REACH and MSHA sponsored activities.
LONG-TERM OUTCOMES	PERFORMANCE MEASURES
1. Reduce health impacts from localized exposure to smoke and PM _{2.5} .	On-going enhancement and promotion of desktop and portable versions of Today's Air. On-going promotion of and participation in partnerships and local activities. Genesis of new outreach opportunities beyond REACH and MSHA.
2. Identification of areas with localized air quality issues and events where data was previously unavailable.	Use monitoring data to issue air quality alerts. Use data to inform DEQ about where additional air management activities may be beneficial to community health.
3. Maintain a robust NAAQS-compliant ambient air monitoring network that also achieves the goals of being community-focused, smoke-ready, health-impact driven, and buildable for the future.	Full implementation of the project summarized in this grant application.

Table 2. Project Timeline and Milestones

YEAR ONE: NOV. 2022 – NOV. 2023				YEAR TWO: NOV. 2023 – NOV. 2024				YEAR THREE: NOV. 2024 – NOV. 2025			
QTR.	MILESTONE	DATE(S)	TASKS	QTR.	MILESTONE	DATE(S)	TASKS	QTR.	MILESTONE	DATE(S)	TASKS
1	1	11/01/22	Start date.	1	1	11/01/23 - 01/31/24	Procurement of equipment in support of 2024 installations.	1	1	11/01/24 - 01/31/25	Procurement of remaining PurpleAir sensors for 2025 installation.
1	2	11/01/22 - 01/31/23	Procurement of equipment in support of 2023 installations.	1	2	01/31/24	Y2Q1 progress report due.	1	2	01/31/25	Y3Q1 progress report due.
1	3	01/31/23	Y1Q1 progress report due.	2	3	01/31/24 - 05/30/24	Logistics for 2023 FEM and EBAM deployment.	2	3	01/31/25 - 04/30/25	Logistics for 2025 PurpleAir deployment.
2	4	01/31/23 - 05/30/23	Logistics for 2023 FEM and EBAM deployment.	2	4	04/30/24	Y2Q2 progress report due.	2	4	04/30/25	Y3Q2 progress report due.
2	5	04/30/23	Y1Q2 progress report due.	3	5	May 2024 TBD	REACH 2024 Air Quality Symposium.	3	5	May 2025 TBD	REACH 2024 Air Quality Symposium.
3	6	May 2023 TBD	REACH 2023 Air Quality Symposium.	3	6	05/01/24 - 11/15/24	Installation of 3 FEMs and 7 EBAMs.	3	6	05/01/25 - 09/31/25	Distribution of remaining 50-60 PurpleAir sensors.
3	7	05/01/23 - 11/15/23	Installation of 3 FEMs and 6 EBAMs.	3	7	07/31/24	Y2Q3 progress report due.	3	7	07/31/25	Y3Q3 progress report due.
3	8	07/31/23	Y1Q3 progress report due.	4	8	08/01/24 - 10/31/24	Fall outreach activities and distribution of 50-60 PurpleAir sensors.	4	8	08/01/25 - 10/31/25	Fall outreach activities and final data processing.
4	9	08/01/23 - 10/31/23	Fall outreach activities and distribution of 50-60 PurpleAir sensors.	4	9	08/01/24 - 10/31/24	Establish new monitor/sensor link to public website.	4	9	08/01/25 - 10/31/25	Establish PurpleAir sensor links to public website.
4	10	08/01/23 - 10/31/23	Establish new monitor/sensor link to public website.	4	10	10/31/24	Y2Q4 progress report due.	4	10	10/31/25	Y3Q4 progress report due.
4	11	10/31/23	Y1Q4 progress report due.					N/A	11	1/31/26	Prepare and submit final project report.

Qtr. – Quarter TBD – To be determined YXQX – where X is a number, Y is year and Q is quarter.

Table 3. Recent Federal and Non-Federally Funded Assistance Agreements

AGENCY	CFDA	GRANT	DESCRIPTION	DURATION	AMOUNT	DESCRIPTION & REPORTING
EPA	66.034	PM-96839001	PM _{2.5}	04/01/2017-03/31/2022	\$1,701,570	Grant has been successfully managed to date. Bi-annual financial reports have been completed on time. A final report will be submitted less than 120 days after the grant ends on 03/31/2022.
EPA	66.605	BG-99861320	PPG Grant - FY20-21-22	10/01/2019-09/30/2022	\$3,155,088	Grant has been successfully managed to date. Financial reporting is due once a year. Reporting has been completed on time through the end of the fiscal year 2021 (ended Sept. 30, 2021). Programmatic reporting is done through a separate performance partnership agreement (PPA). We currently satisfy all negotiated terms of the PPA.
EPA	66.040	DS-96896401	EPA State Clean Diesel Grant	10/01/2019-09/30/2022	\$1,118,272	Quarterly programmatic and financial reporting is required. DEQ is current on reporting through Quarter 1 of 2022.
EPA	66.717	X9-96881701	Energy SRA	11/21/2018-12/1/2021	\$103,482	This grant ended in December 2021. Only final reporting was required. The final report was submitted on time and accepted.

CFDA – catalog of federal domestic assistance number

PPG – performance partnership grant

SRA-source reduction assistance

Table 4. Budget Table

LINE ITEM & ITEMIZED COSTS	EPA Funding
Personnel Covered by other federal funding.	
TOTAL PERSONNEL	\$ -
Fringe Benefits (Retirement, Health, FICA, SUI) Covered by other federal funding.	
TOTAL FRINGE BENEFITS	\$ -
Travel Covered by other federal funding.	
TOTAL TRAVEL	\$ -
Equipment* 6 FEM-configured BAM-1022 monitors @ 18,630/unit 13 EBAM portable monitors @ 10,960/unit	\$ 111,780 \$ 142,480
TOTAL EQUIPMENT	\$ 254,260
Supplies 164 PurpleAir sensors @ \$280.00/unit 19 Digi cellular modems @ \$700/unit Fencing for 9 sites @ \$400/site Hardware, wiring and parts for 19 monitor sites @ \$200/site 19 Web power switches @ \$140/unit BAM-1022 filter tape for 6 sites @ 6 tapes per year per monitor and \$90/unit, for 3-year funding period EBAM filter tape for 13 sites @ 1 tape per year per monitor and \$90/unit, for 3-year funding period 1 Alicat multical (flow/pressure/temp) calibration device 13 EBAM Pump rebuild kits @ \$350/unit 6 BAM-1022 replacement pumps for @ \$700/unit Outreach supplies	\$ 45,920 \$ 13,300 \$ 3,600 \$ 3,800 \$ 2,660 \$ 9,720 \$ 3,510 \$ 2,100 \$ 4,550 \$ 4,200 \$ 5,000
TOTAL SUPPLIES	\$ 98,360
Contractual Establish electrical service at 6 sites @ \$4000/site	\$ 24,000
TOTAL CONTRACTUAL	\$ 24,000
Other Electrical service for 19 sites for 36 months (3 years) @ \$55/month Cellular service for 19 sites for 36 months (3 years) @\$38/month Community meeting logistics	\$ 37,620 \$ 25,992 \$ 5,000
TOTAL OTHER	\$ 68,612
Indirect Charges Federal indirect operational costs (4% of total less equipment)	\$ 7,639
TOTAL INDIRECT	\$ 7,639
TOTAL FUNDING	\$ 452,871
TOTAL PROJECT COST	\$ 452,871

*Exempt from indirect charges